CAP·10B

CAPTIVATING

From France, with feeling

BY MARK R. TWOMBLY

Daniel Heligoin and Montaine Mallet, known collectively as the French Connection, travel the air show circuit performing canopy-to-canopy formation aerobatics in identical CAP 10Bs. At the start of the takeoff roll, Heligoin places his spinning prop three feet from Mallet's

PHOTOGRAPHY BY MIKE FIZER

right wing tip, and there it stays through a full repertoire of low-level gymnastics. Heligoin and Mallet are able ambassadors for the French-built two-seater. They not only convincingly demonstrate its aerobatic capabilities, they also are the exclusive North American retailer for the manufacturer.

Despite the exposure from the French Connection, the CAP 10B remains something of a secret in this country. It has been here for 15 years, but only about 30 are in the hands of owners. These fortunate few enjoy one of the sweetest flying machines available.

The airplane is hand-built in Bernay, France, by the small firm of Avions Mudry and Company. Mudry employees are woodworkers. The CAP 10B airframe is fashioned from wood with spruce spars and plywood-covered wings, forward fuselage, and empennage. A protective fabric covering is applied over the plywood.

The design descended from Claude Piel's CP 100 Emeraude Sport, which first flew in the early 1960s. Piel, a prolific designer of wooden airplanes, sold plans to homebuilders and granted licenses for factory production. One of the licensees was Auguste Mudry, whose airplane repair and glider firm, Coopérative des Ateliers Aéronautiques de la Région Parisienne (CAARP), built a few Super Emeraudes in 1965. Mudry's real interest, however, was in producing an airplane that could carry the company name. He believed there was a market for a two-place sport aerobatic trainer, so he hired Piel and several other engineers to develop a modified version of the Emeraude Sport. A prototype, designated CAP (from CAARP) 10, was built and flown in 1968.

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At about that time the French air force solicited bids for a light, two-seat, aerobatic airplane. The plan was to form a four-ship aerobatic team to compete in civil contests and to make public appearances for the purpose of recruiting. The air force evaluated the CAP 10 and ordered four. That was followed by an order for 28 to be used for screening pilot candidates and for primary and aerobatic training. The air force order launched production of the CAP 10 in 1971. During certification trials, some modifications were made, including a larger rudder and ventral fin, and the designation was changed to CAP 10B.

The French navy subsequently ordered about a dozen. More recently, the Mexican air force ordered 20. The Moroccan air force also fields a CAP 10B aerobatic team. It is a popular flying club airplane in France and other countries. About 250 have been built and are flying in 15 countries.

In 1983 the panel was redesigned to accept more instruments and avionics. Mudry also switched from fabric to a fiberglass cap over the aft fuselage.

The CAP 10B has a classic look, neither state of the art nor dated. The inboard section of each wing is rectangular. The outboard panels are semi-elliptical, with each wing tip tapering to a gentle curve. A radiant red-and-white sunburst paint scheme is a perfect complement to the short-span, wide-chord planform. The rudder is huge, and the wide fuselage sits up on a pair of straight, stout, oleo main gear struts. It is a spunky, friendly looking airplane.

Mudry also builds the CAP 21 and CAP 230, single-seat, higher performance derivatives of the CAP 10B. The sharp angles and lean physiques of the CAP 21 and 230 impart a more severe image that is appropriate for serious unlimited aerobatic competition but that would be out of place on the "let's go have some fun" CAP 10B.

In the debate over the ideal cockpit arrangement, tandem or side by side, champions of in-line seating claim a seat-of-the-pants advantage. Both pilots ride on the longitudinal axis and therefore have a better feel for yaw and roll control. This is especially important in aerobatic maneuvers, where sensory perception and precise control are everything. Even so, the CAP 10B makes a persuasive case for rubbing shoulders. Both pilots can see over the nose on the ground, and only one set of instruments is needed. More important, on training flights the instructor can see what the student is doing, and vice versa. Gestures, eye contact, body language—all of the things that make for more effec-

tive communicating—are present.

Side-by-side seating serves the CAP 10B equally as well in its other roles as cross-country traveler and Saturday afternoon sport airplane. Unlike most other aerobats the CAP 10B is comfortable to fly on extended trips. Though far from spacious, the cockpit is adequate for two average-size adults.

It is comfortable to fly as well. It will cruise at 135 knots for about three hours and still have an hour's fuel remaining. The wing has a five-degree dihedral for lateral stability. The dihedral detracts somewhat from inverted stability, but the payoff is docile manners in normal cruise flight. A shelf behind the seats can accommodate 100 pounds of overnight bags, spare parachutes, and Aresti manuals. Useful load for nonaerobatic flight is 630 pounds, which is enough for two FAA adults, full fuel, and about 50 pounds of baggage.

Fuel is carried in two tanks, 19 gallons ahead of the cockpit and 20.6 gallons behind. Only the front tank is approved for inverted flight. The rear tank will vent fuel when inverted, so it must be empty if the flight plan calls for going upside down.

Dual throttles are provided, one in the far left corner, the second in the middle. The only mixture control is located to the left. The mag switch, starter button, and fuel tank selector are contained in a small subpanel beneath the middle of the main panel. On older models the battery switch is hidden behind the pilots on the cargo shelf. You will only forget once, maybe twice, to switch it on before strapping into parachute, five-point restraint system, and a final safety lap belt.

Lest a first-time passenger mistake the CAP 10B for an ordinary two-seater, the pilot should make it a check list item to point out the upside-down inclinometer (for confirming wings level while inverted), accelerometer (to tally the Gs, up to six positive and 4.5 negative allowed), and leather straps on the rudder pedals (to keep the feet planted while slithering though unusual attitudes).

Heligoin and Mallet have been associated with the CAP 10B almost since its inception. Heligoin was a fighter pilot in the French air force when the call went out for volunteers to form a light airplane aerobatic squad. Heligoin signed up and was named the leader. One of his first jobs was to evaluate the CAP 10. When he retired from the military after 20 years, he joined Mudry Aviation as a

test pilot.

Mallet was a young engineering student and fledgling pilot working on a glider rating at the Aerodrome de Beynes when she saw the CAP 10 prototype make its first flight. She fell in love with it and soon was working for Mudry. Late in 1972 Mudry asked Heligoin and Mallet to go to the United States to shepherd FAA certification of the CAP 10B and establish a sales office. They did, and in 1975 became independent sales representatives. In 1976 they settled on Dutchess County Airport near Poughkeepsie, New York, as a base after having had offices at Orange County and Sky Acres in New York.

Theirs is a three-part business that offers one-stop CAP 10B shopping. They fly about two dozen performances a season as the French Connection Air Show, Incorporated. Mudry Aviation Limited handles new airplane sales and also operates an aerobatic school using two CAP 10Bs painted in the red, white, and blue livery of the French air force. Air show, sales, and aerobatic school all are based in a small warren of offices in a corner of Richmor Aviation, Incorporated's FBO at Dutchess County.

Heligoin and Mallet are kept busy with details of air show appearances and sales. The aerobatic school is run by Claude Chanclu. Students come from all over the country and the world for safety, basic, and advanced aerobatic courses. Heligoin and Mallet believe strongly that aerobatic students should be able to practice their craft solo and put themselves to the test by competing if they are so inclined. The school trainers are insured for student solo rental, including participation in contests. Chanclu or Mallet accompanies students to contests to critique them from the ground. They also sponsor an annual aerobatic contest for their students. Without competition, many aerobatic pilots would lose interest in the sport. Heligoin and Mallet are to be commended for enabling their students to experience the unique thrill of solo aerobatics and competition.

My first flight was with Mallet, who flies lead in the French Connection. A first-time CAP 10B pilot will begin training the moment the airplane rolls away from the chocks. Ground handling is sensitive, courtesy of the short wheelbase and oversize rudder. The tailwheel is steerable through the rudder pedals. Mallet makes a final "fuel, flight controls" check just before we begin the takeoff roll, and soon we are climbing away to the aerobatic practice area.

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It is immediately apparent that the CAP 10B rewards finesse. The ailerons span more than 40 percent of the wing, and the airplane responds instantly and precisely to control inputs. Gross weight for aerobatic flight is a trim 1,675 pounds, so the 180-horsepower Lycoming provides a good balance of performance, economy, and weight. Energy management is an important part of CAP 10B training. With two aboard, there simply is not a lot of extra horsepower to quickly climb back to a safe working altitude after losing a thousand feet or so in a maneuver.

The Christen inverted oil system and inverted forward fuel tank allow for sustained flight while hanging from the belts. The engine turns a Hoffman wooden fixed-pitch propeller. The pilot soon learns to coordinate the throttle with pitch attitude: Add throttle in a climbing maneuver to maintain rpm, retard on the downside.

The second flight was with Heligoin, who is as reticent as Mallet is effusive. Heligoin put the CAP 10B—and me—through the paces, demonstrating advanced and unlimited maneuvers. It was the first time I had seen an outside loop from the vantage point of the cockpit. In the midst of straining against the unnerving sensation that I was about to be ejected out the big bubble canopy, I re-

member being very impressed with the agility of the little 180-hp wooden contortionist.

A new CAP 10B sells for $118,800. The price is tied to the franc-to-dollar exchange rate, which for some time has tipped heavily in favor of the franc. Price is not so much a disincentive to a potential buyer as tunnel vision. Many of us think of airplanes as transportation vehicles, gadabout sport airplanes, or single-purpose specialists, with very little overlap. We choose a function and find an airplane to fulfill it. The CAP 10B is more versatile. It successfully blends sport and competition aerobatics, training, and sporty cross-country traveling. That it can undertake all three jobs is rare; that it performs so well at each is remarkable. □

Avions Mudry CAP 10B
Base price: $118,800

Specifications

Powerplant	Lycoming AEIO-360-B2F 180 hp @ 2,700 rpm
Recommended TBO	1,400 hr
Propeller	Hoffman two-blade, fixed-pitch
Length	23.42 ft
Height	7.54 ft
Wingspan	26.42 ft
Wing area	116.8 sq ft
Wing loading	15.6 lb/sq ft
Power loading	10.17 lb/hp (normal); 9.30 lb/hp (aerobatic)
Seats	2
Cabin width	3.44 ft
Empty weight	1,210 lb
Gross weight	1,830 lb
Useful load	630 lb (normal)
Payload w/full fuel	394 lb
Max aerobatic weight	1,675 lb
Fuel capacity, std	41 gal (39.6 gal usable) 246 lb (237.6 lb usable)
Baggage capacity	100 lb

Performance

Takeoff distance, ground roll	1,149 ft
Takeoff distance over 50-ft obstacle	1,477 ft
Max demonstrated crosswind component	20 kt
Rate of climb, sea level	1,000 fpm
Max level speed	145 kt
Cruise speed/range w/45-min rsv (fuel consumption) @ 75% power, best economy	130 kt/572 nm (54 pph/9 gph)
Service ceiling	16,400 ft
Landing distance over 50-ft obstacle	1,968 ft
Landing distance, ground roll	1,182 ft

Limiting and Recommended Airspeeds

Vx (best angle of climb)	72 KIAS
Vy (best rate of climb)	78 KIAS
Va (design maneuvering)	108 KIAS
Vfe (max flap extended)	86 KIAS
Vno (max structural cruising)	162 KIAS
Vne (never exceed)	183 KIAS
Vs1 (stall, clean)	54 KIAS
Vso (stall, in landing configuration)	46 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted. □